

# PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:  
GERRARD, et al

Application No.:

09/305,789

Filed:

May 4, 1999

For:

DYNAMIC ACOUSTIC RENDERING



Atty. Docket No.: ARELP102

Examiner: Not assigned

Group: 2747

Date: October 25, 1999

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on Oct 29, 1999 1999.

Signed:

Pat Tate

Pat Tate

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 CFR §§1.56 AND 1.97(c)**

Assistant Commissioner for Patents  
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

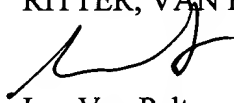
This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

An application of this sytem has been shipping with the PC game 'Half Life', which was released in the fall of 1998, and approximately 7 million PCs have been shipped with software and hardware which implement this invention.

In 1992, Scott Foster and Mike Taylor of Crystal River Engineering (now at Aural) demonstrated a dynamic binaural room simulation system. It was able to render 4 direct path sources with 6 first order reflections each, all with HRTF processing. The room geometry could be dynamically changed although it always had to remain cuboid in shape. The system automatically recomputed the reflections as the listener and sources moved around inside the room. It is described in "Virtual Environment Display for a 3D Audio Room Simulation," which is cited herewith.

This Information Disclosure Statement is believed to be filed before the mailing date of a first Office Action on the merits. Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-0685 (Order No. ARELP102 ).

Respectfully submitted,  
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<b>Form 1449 (Modified)</b>  <b>Information Disclosure Statement By Applicant</b>  (Use Several Sheets if Necessary)	Atty Docket No.	ARELP102
	Application No.:	09/305,789
	Inventor	GERRARD, et al
	Group	2747
	Filing Date	May 4, 1999

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 Group 2700

**U.S. Patent Documents**

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A	5,105,462	Apr 14, 1992	LOWE, et al	381	17	May 2, 1991
	B	5,596,644	Jan 21, 1997	ABEL, et al	381	17	Oct. 27, 1994
	C	5,802,180	Sep. 1, 1998	ABEL, et al	381	17	Jan 17, 1997
	D						
	E						
	F						

**Foreign Patent or Published Foreign Patent Application**

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation	
							Yes	No
	G							
	H							

**Other Documents**

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	I	"Interactive Acoustic Modeling of Complex Environments", <a href="http://www.cs.princeton.edu/~funk/rsas.html">http://www.cs.princeton.edu/~funk/rsas.html</a> .
	J	Funkhouser, Thomas et al, <u>A Beam Tracing Approach to Acoustic Modeling for Interactive Virtual Environments</u> , Computer Graphics (SIGGRAPH '98), Orlando, FL, July, 1998, p. 21-32.
	K	Chapin, William L. et al, "Virtual environment display for a 3D audio room simulation", SPIE '92 Stereoscopic Displays and Applications, 13 Feb 1992, pages 1-12.
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.